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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,441	12/10/2003	Radhakrishnan Subramaniam	4062-104	5153

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EXAMINER

PERT, EVAN T

ART UNIT PAPER NUMBER

2826

DATE MAILED: 04/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/731,441

Applicant(s)

SUBRAMANIAM,  
RADHAKRISHNAN

Examiner

Evan Pert

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to for containing informalities:

Applicant may choose any style, yet the style should be grammatically proper in English throughout. While the specification as a whole is well written and grammatically proper, the sentence at lines 9-13 of the Background of Invention, for example, is "incomplete" grammar (i.e. the sentence beginning, "These cause many difficulties...").

Line 11 of p. 2 seemingly includes a typographical error wherein "3 to 305" should read --3 to 30%--.

At p. 3, line 2, "has dielectric" should read --has a dielectric--.

At p. 3, line 18, "R.T" should read "R.T.", or "room temperature" (which is interpreted as "about 20 to 25°C," based on the examiner's understanding of "R.T").

At p. 2, applicant uses the phrases "In another embodiment," "In yet another embodiment," and "In still another embodiment" to describe various *aspects* of the invention. The phrases chosen including the word "embodiment" with the word "another" implies a mutually exclusive species of invention, restrictable under a generic claim, for example, which is not the case in the instant application.

Applicant should revise the passages including "embodiment" to read --aspect--, to better clarify the relationships of parameters of the invention.

Correction and/or explanation are required.

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2. The disclosure includes the word "semi-conducting" in the title, at the 1<sup>st</sup> and last lines of the abstract, at lines 4, 26, 30 and 32/33 of p. 1, line 27 of p. 2, line 3 of Example 2 on p. 3, and at the 7<sup>th</sup>-to-last line of p. 4.

While those of skill in the art should be easily able to recognize that applicant is not writing about a "semiconductor" band-gap material, the specification is potentially misleading and therefore objectionable. For example, there was obvious difficulty internally at the USPTO in properly classifying this case because it was directed to examination in the "semiconductor" art. However, the meaning of a "semiconductor" material includes more than the defining parameter of "resistivity" alone:

A "semiconductor" is a material with a resistivity (i.e. a conductivity) that is in a range somewhere between that of insulators and conductors AND the material has a "band gap" (Official Notice).

Applicant's use of the term "semi-conducting," such as "in semi-conducting state" at line 30 of p. 1, is understood in *the context* of the specification, such as at the last sentence of the second-to-last paragraph of p. 4, wherein the films of the invention are "semi-conducting *compared to* the normal insulating polyvinylidene fluoride," or at p. 3 where one "gets a semi-conducting composition."

Table 1 shows "electrical conductivity" that is on the order of a band-gap semiconductor," yet the PVDF of the invention is not a band gap "semiconductor," even though the PDVF of the invention can be said to have a resistivity (i.e. conductivity) in a so-called "semi-conducting" range.

While applicant is simply using the pre-fix "semi-" against the word "conducting" to mean something different than a "semiconductor," as has been practiced by others, the title and specification in this case are not clear enough for proper compliance with 37 CFR 1.71:

Applicant is required to explain the meaning of "semi-conducting" in the disclosure by amendment to the specification, or is required to change the originally filed text to clearly delineate the intended meaning: For example, at p. 1, line 30, "and in semi-conducting state" could be changed to --and with significantly greater conductivity than conventional PVDF--, for example.

#### ***Claim Objections***

3. Claims 1 and 8 are objected to as they contain informalities:

In claim 1, "beta crystalline" should read -- a beta crystalline--.

In claim 1, "thereto, removing" should read --thereto, and removing--.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the "polymer film" is limited to being "semi-conducting" yet a *definite* range of conductivity (i.e. resistivity<sup>1</sup>) is not established by the specification to clarify the scope of a "semi-conducting" polymer film as compared to a "conducting" polymer, for example. For purposes of examination, a "semi-conducting" PVDF is the same as a "conducting" PVDF, differing only in a *relative degree of conductivity*.

In claim 9, "the electric potential used for treatment" lacks antecedent basis.

In claim 11, "the duration of application" lacks antecedent basis.

In claims 12 and 13, "the temperature used for conditioning" lacks antecedent basis.

***Allowable Subject Matter***

5. Claims 1-14 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose applicant's claimed process for the preparation of a polymer film containing a beta crystalline phase of polyvinylidene fluoride (i.e. PVDF), characterized by 1) dissolving PVDF in a solvent, 2) dispersing conducting particles therein, 3) casting and drying, and 4) holding the film between two metal plates and applying an electric potential thereto.

Applicant's claimed methodology is particularly advantageous in that a polymer film that contains a significant portion of beta crystalline PVDF can be prepared using safer electric potentials than used for "poling" in the prior art [background of invention].

**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 2005/0065280 A1 discloses a process for preparation of conducting/semi-conducting polymer.

US 6,746,627 B2 discloses an electrically conductive composite comprising PVDF with carbon nanotubes mixed in.

US 6,331,330 discloses background information about beta crystalline PVDF, at cols. 8-10, for example.

US 5,254,296 discloses simultaneous stretching and poling to get beta crystalline PVDF.

US 4,820,586 discloses poling an amorphous film to get a beta crystalline form.

US 4,808,352 discloses radiation to enhance the beta crystalline form.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP  
April 6, 2005

  
**EVAN PERT**  
**PRIMARY EXAMINER**